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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,350	03/25/2005	Robert B. Hall	857-034	4761

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EXAMINER	
WARTALOWICZ, PAUL A	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/529,350	HALL ET AL.	
	Examiner	Art Unit	
	PAUL A. WARTALOWICZ	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *25-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/25/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 10/31/08 have been fully considered but they are not persuasive.

Applicant argues that claims 1-31 are sufficiently related such that a thorough and complete search of the elected claims would necessarily encompass a thorough and complete search for the subject matter of the non-elected claims.

However the standard under 371 practice is the technical feature test described in the election restriction. Additionally, a complete search of the method would not encompass a complete search of the apparatus because the apparatus requires additional search areas not required by the method.

The restriction is deemed FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, and 9 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Baba et al. (US 6090361).

Baba teach a method of purifying silicon (col. 1) comprising melting solid material to form liquefied material (providing molten silicon indicates that a solid silicon material was melted to form the liquefied material, col. 2) wherein the liquefied material is directional solidified to form a liquid portion containing impurities and a solid silicon purified portion (col. 5) and melting the purified solid silicon to produce a liquefied material (col. 10, claim 1) wherein the silicon is metallurgical silicon (col. 2) and wherein the purifying process is repeated (col. 7). Additionally, Baba teaches that the solidification rate is less than 10 mm/minute (col. 2).

If Baba does not anticipate the limitation of remelting the purified silicon after removing the liquid containing impurities, it would have been obvious based on the teaching of Baba of remelting the purified silicon after cutting a solid containing impurities.

As to claims 6 and 9, Baba teach a substantially similar process including partially directionally solidifying the molten silicon and leaving the portion of the silicon

containing impurities a liquid and removing the liquid. One of ordinary skill in the art would recognize the portion of the purified solidified material and the depth of the solid silicon would depend on the amount of impurities initially contained within the silicon raw material.

Regarding claim 5, metallurgical silicon has a silicon value comprises at least 95% silicon by weight.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baba et al. (US 6090361) in view Schmid et al. (US 6368403).

Baba teach a method as described above.

Baba fails to teach adding silicon oxide to the solid starting material.

Schmid teach a process of purifying silicon (col. 1) wherein silica is added to the molten silicon to be purified for the purpose of forming a slag (col. 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide silica is added to the molten silicon to be purified in Baba in order to form a slag as taught by Schmid.

Additionally adding the silica to the molten silicon rather than the solid silicon as claimed does not illustrate a patentable difference over the prior art in the absence of unexpected results. This is a mere difference in sequence of adding ingredients. MPEP 2144.04.

Claims 1-6, 9-12,14-17, 20, 21, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baba et al. (US 6090361) in view of Hanazawa et al. (U.S. 6231826) and Wakita (6299682).

Baba teach a method of purifying silicon (col. 1) comprising melting solid material to form liquefied material (providing molten silicon indicates that a solid silicon material was melted to form the liquefied material, col. 2) wherein the liquefied material is directional solidified to form a liquid portion containing impurities and a solid silicon purified portion (col. 5) and melting the purified solid silicon to produce a liquefied material (col. 10, claim 1) wherein the silicon is metallurgical silicon (col. 2) and wherein the purifying process is repeated (col. 7). Additionally Baba teaches that the solidification rate is less than 10 mm/minute (col. 2).

If Baba does not anticipate the limitation of remelting the purified silicon after removing the liquid containing impurities, it would have been obvious based on the teaching of Baba of remelting the purified silicon after cutting a solid containing impurities.

As to claims 6, 9, 17 and 20, Baba teach a substantially similar process including partially directionally solidifying the molten silicon and leaving the portion of the silicon containing impurities a liquid and removing the liquid. One of ordinary skill in the art would recognize the portion of the purified solidified material and the depth of the solid silicon would depend on the amount of impurities initially contained within the silicon raw material.

Regarding claims 5 and 16, metallurgical silicon has a silicon value comprises at least 95% silicon by weight.

Baba fails to teach removing the purified reliquefied material from the container.

Hanazawa teach a method of purifying silicon (col. 1) wherein a solid purified silicon product is remelted for the purpose of moving the purified molten silicon to a forming mold (col. 6).

Therefore it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a solid purified silicon product is remelted in Baba in order to move the purified molten silicon to a forming mold as taught by Hanazawa.

Baba fails to teach depositing solid material in a container and melting the solid to form liquefied material.

Wakita teach a method of purifying silicon wherein a silicon raw material is deposited and melted in a crucible for the purpose of providing a molten silicon raw material to be directionally solidified (col. 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a silicon raw material is deposited in a crucible and then melted in Baba in order to provide a molten silicon raw material to be directionally solidified as taught by Wakita.

As to claim 22, the plurality of containers appears to be a multiple part producing a multiple effect that one of ordinary skill in the art would recognize would result from multiple containers and would not be unexpected. MPEP 2144.04.

Claims 7, 8, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baba et al. (US 6090361) in view of Hanazawa et al. (U.S. 6231826) and Schmid et al. (US 6368403).

Baba teach a method as described above.

Baba fails to teach adding silicon oxide to the solid starting material.

Schmid teach a process of purifying silicon (col. 1) wherein silica is added to the molten silicon to be purified for the purpose of forming a slag (col. 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide silica is added to the molten silicon to be purified in Baba in order to form a slag as taught by Schmid.

Additionally, adding the silica to the molten silicon rather than the solid silicon as claimed does not illustrate a patentable difference over the prior art in the absence of unexpected results. This is a mere difference in sequence of adding ingredients. MPEP 2144.04.

Claims 13 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baba et al. (US 6090361) in view of Hanazawa et al. (U.S. 6231826) and Wakita (6299682) and Helmreich (US 4312700).

Baba teach a method as described above.

Baba fails to teach wherein the container is recycled and repeating a purification procedure for a new charge of solid material.

Helmreich teach a process for purifying silicon (col. 1) wherein it is known to reuse the crucible and repeat a purification procedure for a new charge of solid material in which the silicon has been purified (col. 3).

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide reusing the crucible to carry out the purification procedure for a new charge of solid material in Baba in order to carry out a substantially similar process of purifying silicon as taught by Helmreich.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
January 17, 2009

Steven Bos
Primary Examiner
A.U. 1793

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